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A NEW MANGROVE-ASSOCIATED SCALE INSECT OF SULUASPIS FROM THE SOLOMON ISLANDS (STERNORRHYNCHA: COCCOIDEA: DIASPIDIDAE)

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Abstract

TAKAGI, S. and GERMAIN, J.-F., 2008. A new mangrove-associated scale insect of *Suluaspis* from the Solomon Islands (Sternorrhyncha: Coccoidea: Diaspididae). *Ins. matsum. n. s*. 64: 127–134, 3 figs.

Suluaspis vanikoroana, sp. nov., is described from Vanikoro, the Solomon Islands. It was collected on an undetermined mangrove, and represents a second species of *Suluaspis*, a genus recently erected on the basis of the mangrove-associated *S. rhizophorae* from the Philippines. As compared with the type species, the new species is primitive in having distinct third trullae and may be derivative in having short minute ducts submarginally on the prepygidial dorsum and filiform ducts on the pygidial dorsum. The two species are widely separated in distribution, and the locality of the new species is an oceanic islet group remote from larger islands. All this suggests that the genus has further species occurring probably in association with mangroves in a broad region including tropical eastern Asia and islands of the western Pacific.

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Introduction

The scale insect genus *Suluaspis*, tribe Aspidiotini, was recently erected on the basis of *S. rhizophorae*, which was described from Palawan Is. and Luzón Is., the Philippines, and from the mangrove *Rhizophora apiculata* (Takagi, 2007). Shortly after that, the junior author received material of scale insects collected by H.-P. Aberlenc from an undetermined mangrove on one of the Vanikoro islets, which are situated southeast of the main archipelago of the Solomon Islands. In examining specimens mounted from the material, the authors have agreed that the specimens represent a second species of *Suluaspis*. As compared with *S. rhizophorae*, the new species is peculiar in a few characters, but it is very close to the former in main characters of the pygidium, thus reinforcing the genus, which was originally monobasic.

Years ago, outbreaks of a scale insect occurred in mangrove plantations on Benoa Bay, Bali Is., Indonesia. This scale, *Aulacaspis marina*, was described as a new species (Takagi and Williams, 1998), and its life history and damage to seedlings were studied (Ozaki et al., 1999). In general, however, our knowledge of mangrove-inhabiting scale insects is still very meagre. The collection available to the senior author includes some scale insects collected on mangroves, but they are from a limited number of localities mainly in Malaysia, Indonesia, and the Philippines, thus representing only fragments from the scale insect fauna associated with mangroves in this region. In spite of the peculiar environments they live in, most of them belong to some genera (*Lepidosaphes*, *Pseudaulacaspis*, *Fiorinia*, *Aulacaspis*, *Pinnaspis*, *Parlatoria*, *Aspidiotus*, *Aonidiella*, and so on) that have abundant species, or are commonly found, on inland plants. A few others may represent stenotopic genera exclusively associated with mangroves, and *Suluaspis* may be one of such genera. However, the inland fauna of scale insects in this region also has been investigated too insufficiently to show that *Suluaspis* does not occur on plants other than mangroves.

Before going further, the authors express their gratitude to H.-P. Aberlenc for the gift of this interesting scale insect.

Description of the new species

In the following description, the terms ‘trullae’ and ‘pectinae’ are adopted in place of ‘lobes’ and ‘plates’ in authors. In *Suluaspis*, the pectinae have a pair of slender processes on or near the apex, which state is described as ‘bifurcate apically’. They may be, however, a little fimbriate towards the apex on the lateral margin. In the new species, some pectinae are often simple, being not bifurcate apically nor fimbriate. The abbreviations ‘abd I–VIII’ stand for the first to eighth abdominal segments.

A diagnosis of the genus *Suluaspis*, based on the type species and the new species, is given at the conclusion of the paper.

Suluaspis vanikoroana Takagi and Germain, sp. nov.

Material examined. Collected on one of the Vanikoro islets, the Solomon Islands, from an undetermined mangrove in February, 2007. Tests [scales] occurring on the lower surface of the leaves; female test (Fig. 1) circular, slightly convex, about 1mm in diameter, whitish, and very thin, with the exuvial casts yellowish and subcentral. Seventeen mounted specimens of the adult female

have been examined. Holotype (adult female): deposited in the collection of Muséum National d' Histoire Naturelle, Paris, France.

Adult female (Figs 1–3). Body obovate, alcohol-preserved specimens whitish, with pygidium darkened towards apex; pygidium composed of abd IV and succeeding segments, usually slightly constricted basally, thus demarcated from prepygidial region. Antennae separated from each other by a space a little wider than frame of mouth-parts, each composed of a round tubercle and a curved seta. Eye-spots distinct. Each spiracle situated in a large sclerotic patch of derm. A submarginal dorsal boss present mesally to each eye-spot ['prosomatic boss'] and on each of abd I and III. Very short minute ducts (with the orifice and the inner sclerotized end nearly superimposed on each other in mounted specimens) occurring submarginally on dorsal surface, forming segmental groups: 3–9 between eye-spot and prosomatic boss (these ducts probably belong to the prothorax), 3–10 on mesothorax, 5–11 on metathorax, 4–11 on abd I, 6–15 on II, and 6–11 on III, those on I and III occurring just laterally to bosses; 1 or 2 at times present on each side of head. Pygidium broadly round marginally; dorsal surface with a transverse median sclerosis subbasally (at times interrupted medially), a pair of scleroses lateroanteriorly to the median sclerosis, and a pair of smaller scleroses far laterally; 4–6 filiform dorsal ducts occurring towards apex of pygidium on each side; anus elliptical, nearly as long as median trullae, situated at about apical 1/3 of pygidium, being separated from the bases of the median trullae by a space about 4 times as long as its longitudinal diameter; ventral surface with a pair of well-developed longitudinal scleroses laterally to vulva; vulva situated towards base of pygidium; apical region of pygidium with aliform sclerosis obscure; no perivulvar disc pores. Median trullae well developed, convergent, appressed together along their mesal margins, each about as long as broad, round apically, deeply notched once laterally, basally with a robust sclerosis, which is as long as the trulla. Second trullae narrowly conical, sharply pointed apically, somewhat variable in length, not exceeding neighbouring pectinae. Third trullae much less prominent, but occupying a distinct space, well sclerotized, flat, at times mucronulate. Pectinae well developed on pygidium; 2 between median and second trullae; 3 (abnormally 2) between the second and third; 12–17 laterally to the third, forming a continuous row, which nearly attains the boundary between abd III and IV; usually these pectinae are bifurcate apically but sometimes they are fimbriate apically or towards the apex on the lateral margin, and those occurring on abd VII and VIII and sometimes also VI tend to be simple; occasionally very slender and linear; lateralmost 2–5 pectinae much shorter and tending to be tubercular; 1–3 tubercular ones also occurring on posterolateral corner of abd III. Marginal setae occurring on dorsal and ventral surfaces of abd IV slender and long, but not exceeding neighbouring pectinae; marginal setae on V–VII, especially dorsal ones, thickened, and dorsal ones on VI and VII very short and robust; dorsal marginal seta on VIII (occurring at outer base of median trulla) very small.

Remarks. The new species, *Suluaspis vanikoroana*, is easily distinguishable from the type species, *S. rhizophorae*, mainly in having the following characters:

1) Very short, minute ducts occur submarginally on the dorsal surface of the prepygidial segments. [In *S. rhizophorae*, usual microducts and small macroducts occur in the prepygidial region along the margin.]

2) The dorsal ducts of the pygidium are filiform. [They are small macroducts and not filiform.]

3) The third trulla is represented by a flat sclerotized prominence, interrupting the row of

pectinae with a distinct space. [The third trulla is probably replaced with a pectina, the row of pectinae being continuous laterally to the second trulla.]
4) The pectinae occur around the pygidial margin, 17–22 in total on each side, their row nearly attaining the boundary between the third and fourth abdominal segments; in addition, 1–3 tubercular pectinae occur on the posterolateral corner of the third abdominal segment. [The pectinae are less numerous, 12–14 occurring on each side of the pygidium; no pectinae are found on the third abdominal segment.] Furthermore, some pectinae, especially those occurring on the sixth to eighth abdominal segments, are often simple.
5) The marginal setae occurring on the sixth and seventh abdominal segments, especially those on the dorsal surface, are very short and robust. [These setae are not particularly shortened, being as long as the pectinae occurring nearby.]

A new diagnosis of Suluaspis

The new species differs from the type species in the numbers of the trullae and pectinae, but apparently these differences have no generic value. In the Diaspididae, the number of trullae was once adopted in coining genera, but it is not always covariant with other features; pectinae except those occurring between trullae tend to vary in number even in the same species. The new species differs also in having much shortened marginal setae on the sixth and seventh abdominal segments, but agrees with the type species in the fact that these setae are noticeably thickened.

The new species is peculiarly characterized in having very short minute ducts occurring in submarginal groups on the prepygidial dorsum. These ducts may be shortened microducts or modified macroducts, because in the type species usual microducts and small macroducts occur submarginally on the prepygidial dorsum. In the type species the dorsal ducts of the pygidium are small macroducts, whereas in the new species they are filiform. In the Diaspididae, the state of ducts may vary between forms which are closely similar in other characters: for example, macroducts and microducts are interchangeable at times and even in the same species. Based on such a general variability, the significance of the differences between the two species in the prepygidial submarginal dorsal ducts and the pygidial dorsal ducts is no more than specific.

As compared with the type species, the new species is primitive in having the distinct third trullae, whereas it may be derivative in the short minute ducts in the prepygidial region and also in the filiform dorsal ducts on the pygidium. The locality of *Suluaspis vanikoroana* is an oceanic islet group remote from larger islands and about 5000km distant from the Philippines, where *S. rhizophorae* occurs. All this suggests that the genus has further species, which are probably associated with mangroves and may be diverse in some characters, in a broad region including tropical eastern Asia and islands of the western Pacific. The concept of the genus *Suluaspis* should be modified to accept *S. vanikoroana* and revised in accordance with the discoveries of further species.

In the present state of our knowledge, *Suluaspis* may be understood as an aspidiotine genus having the following characters: median trullae robust, convergent, appressed together on mesal margins, each with a strong sclerosis extending anteriorly; second trullae each modified into a spiniform or narrowly conical membranous process; third trullae present or absent, and if present much modified in shape; pectinae well developed, bifurcate apically, but some of them may be a little fimbriate or changed into simple or

tubercular processes; marginal setae of pygidium, especially those occurring on abd VI and VII, thickened; dorsal macroducts of pygidium few, reduced in size, or even filiform; anus situated at about apical 1/3 of pygidium.

References

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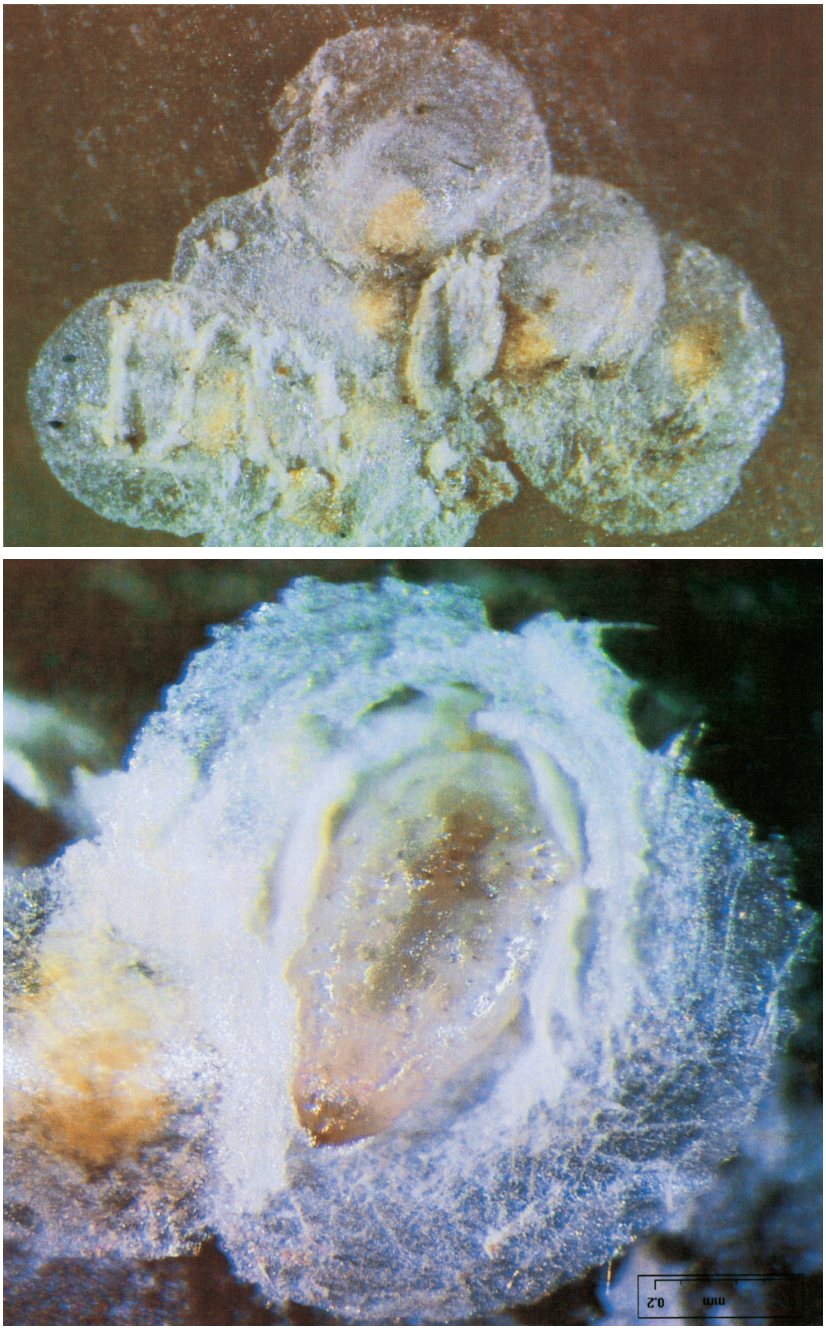

Fig. 1. *Suluaspis vanikoroana*, material preserved in alcohol: upper, female tests; lower, body of adult female in ventral view, 0.6mm in length.

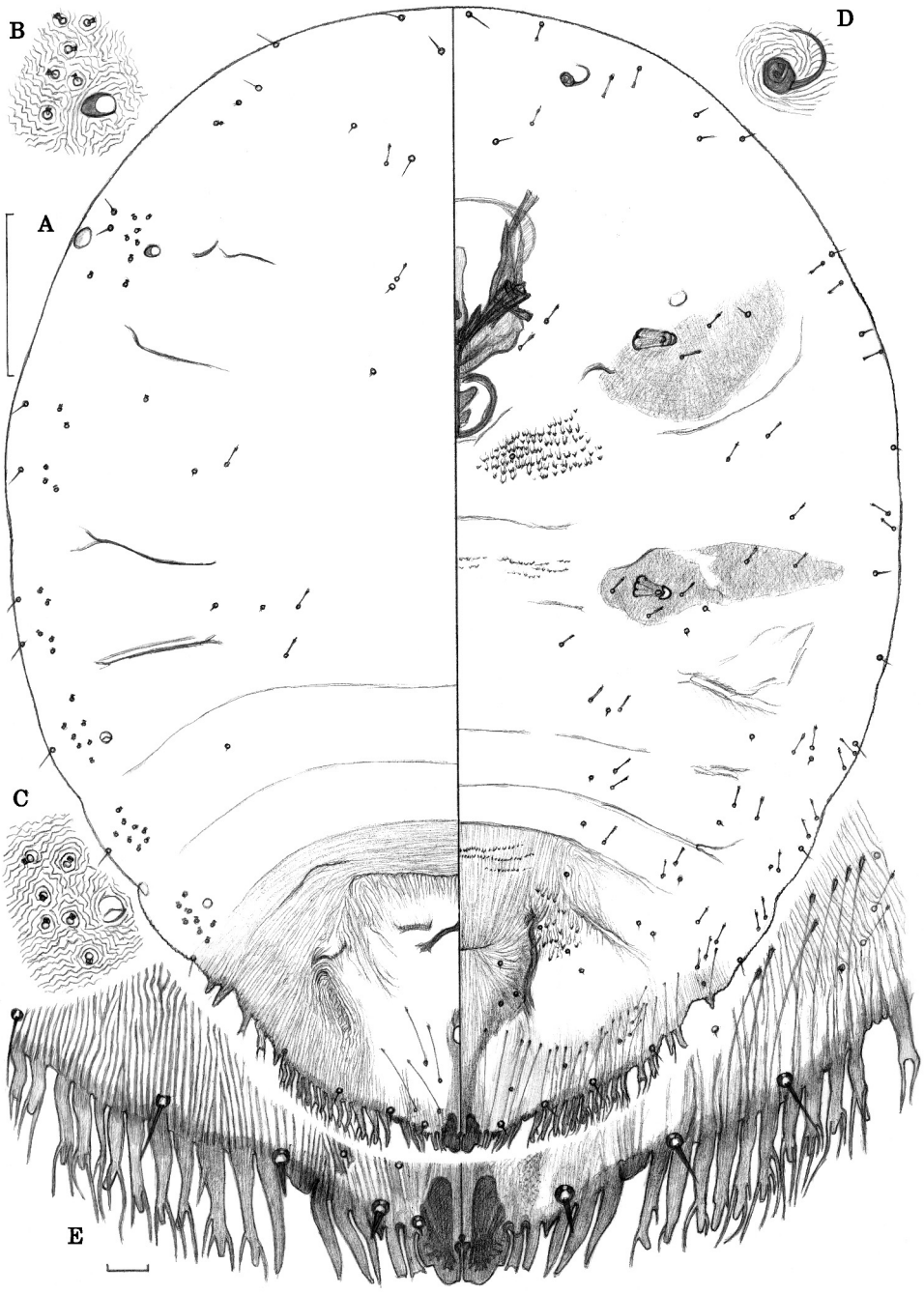

Fig. 2. *Suluaspis vanikoroana*, adult female: B, prosomatic boss and short minute ducts; C, boss and short minute ducts on abd I; D, antenna; E, pygidial margin. Scale bars: A, 100μm; E, 10 μm (B–D mangnified at the same rate as E).

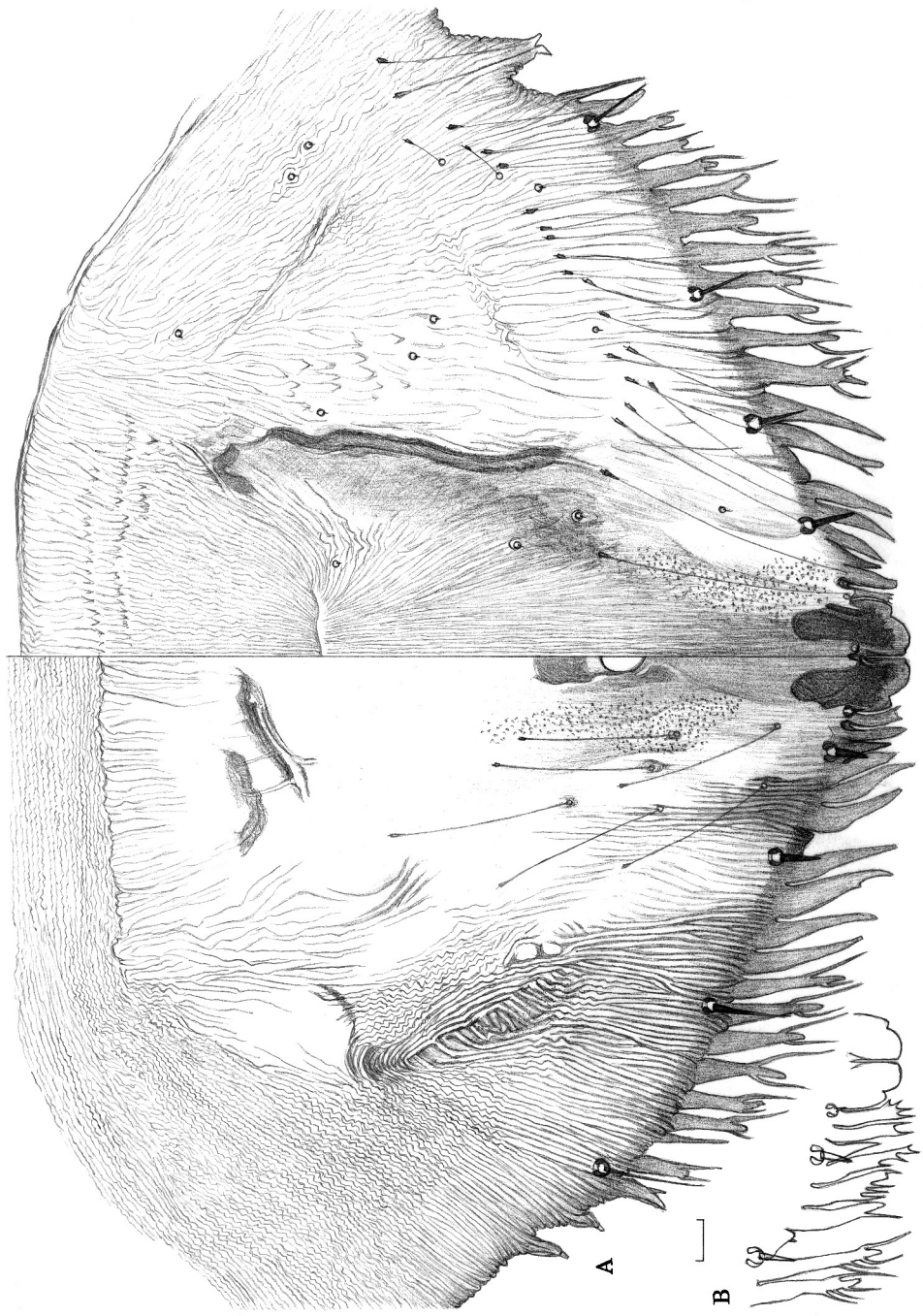

Fig. 3. *Suluaspis vanikoroana*, adult female: A, pygidium; B, apex of pygidium with fimbriate pectinae. Scale bar (for both A and B): 10μm.